

FIGURE 1

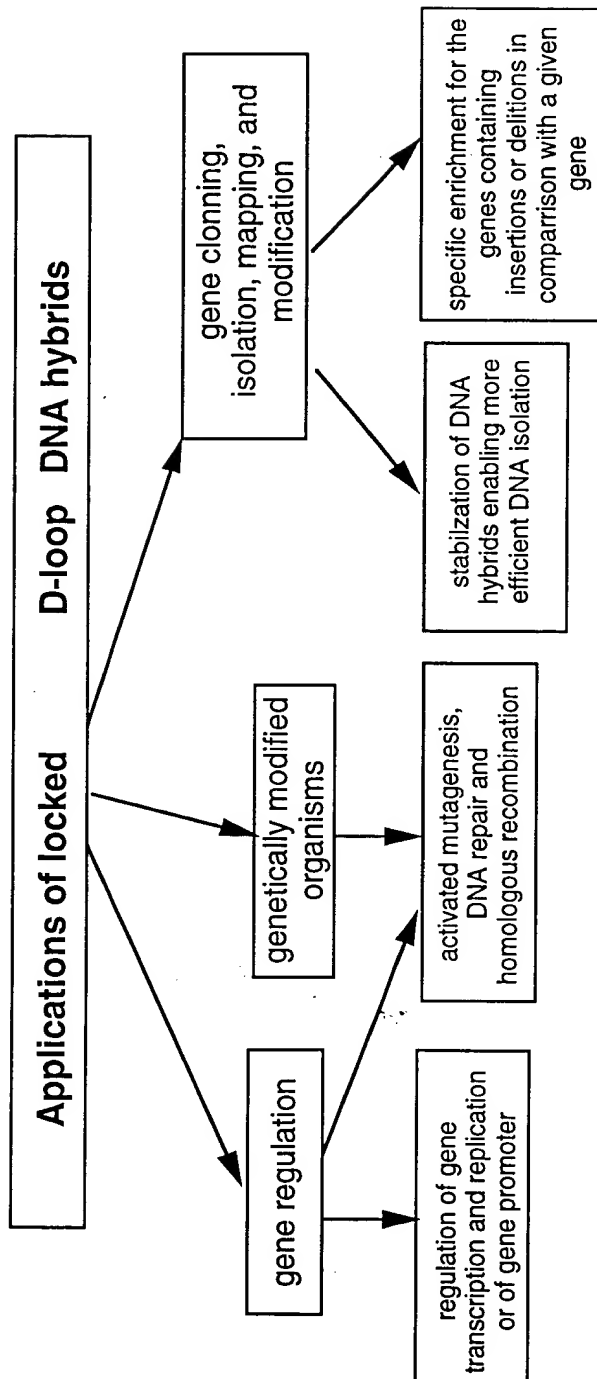
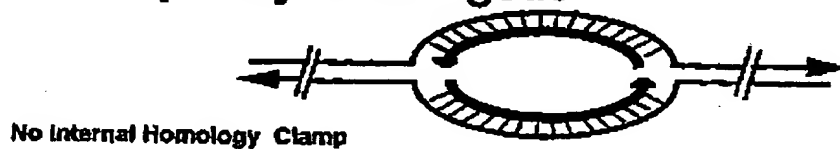


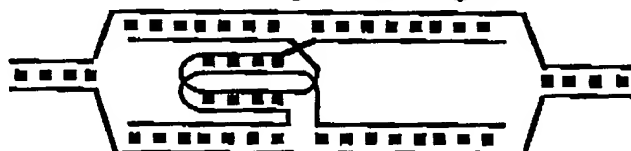
FIGURE 2

A Target DNA completely homologous



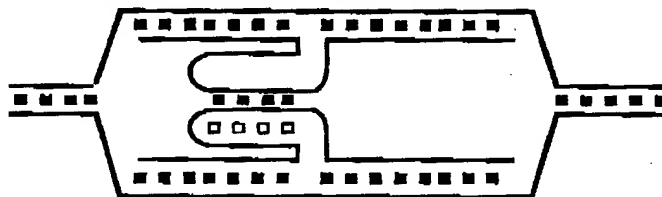
B duplex-forming heterologous insert

B



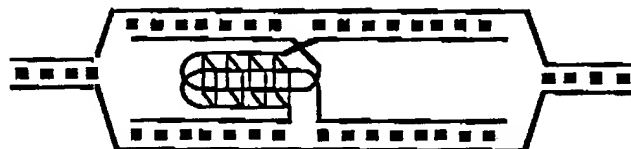
C triplex-forming heterologous insert

C



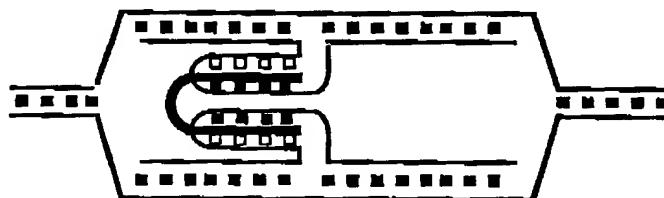
D quadruplex-forming heterologous insert

D



E homologous insert which forms triplex with secondary probe

E



F Target DNA with an insertion

F

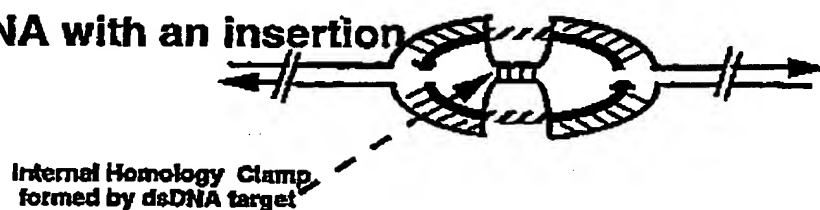
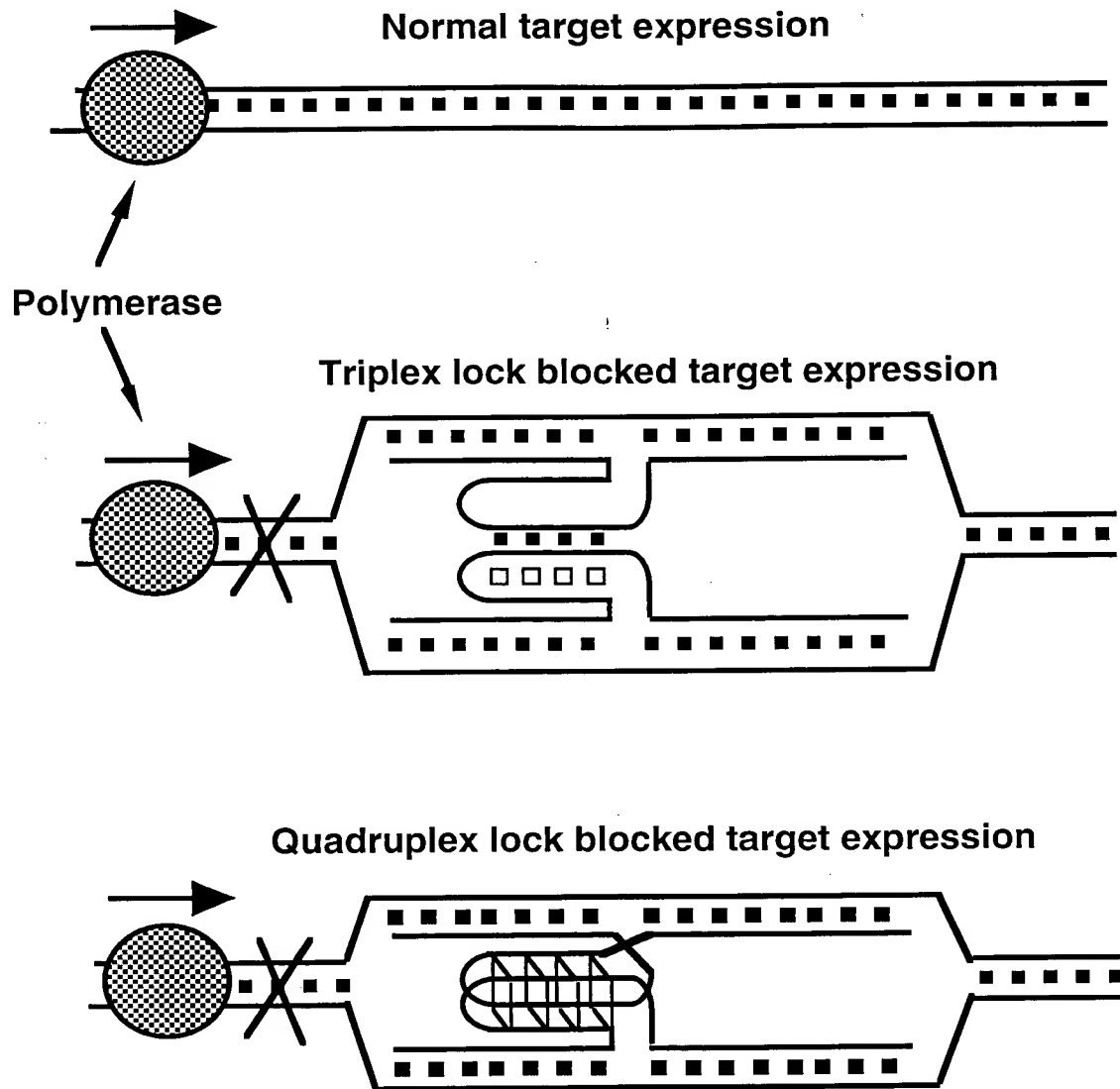
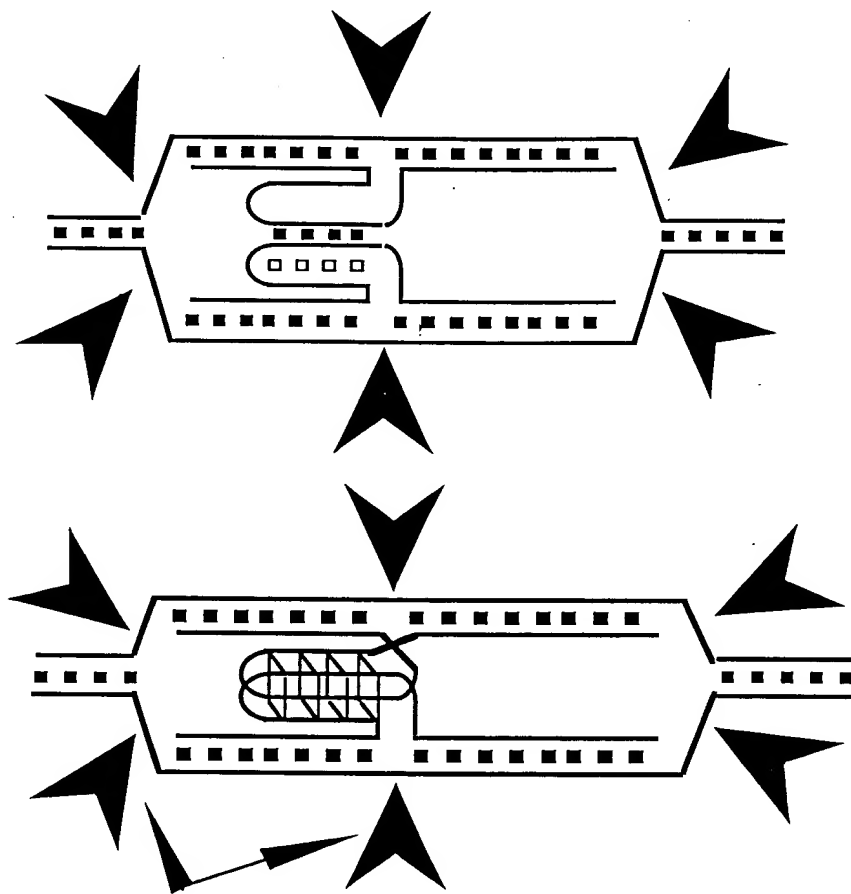


FIGURE 3



001240 "E247560
09557423 "042100

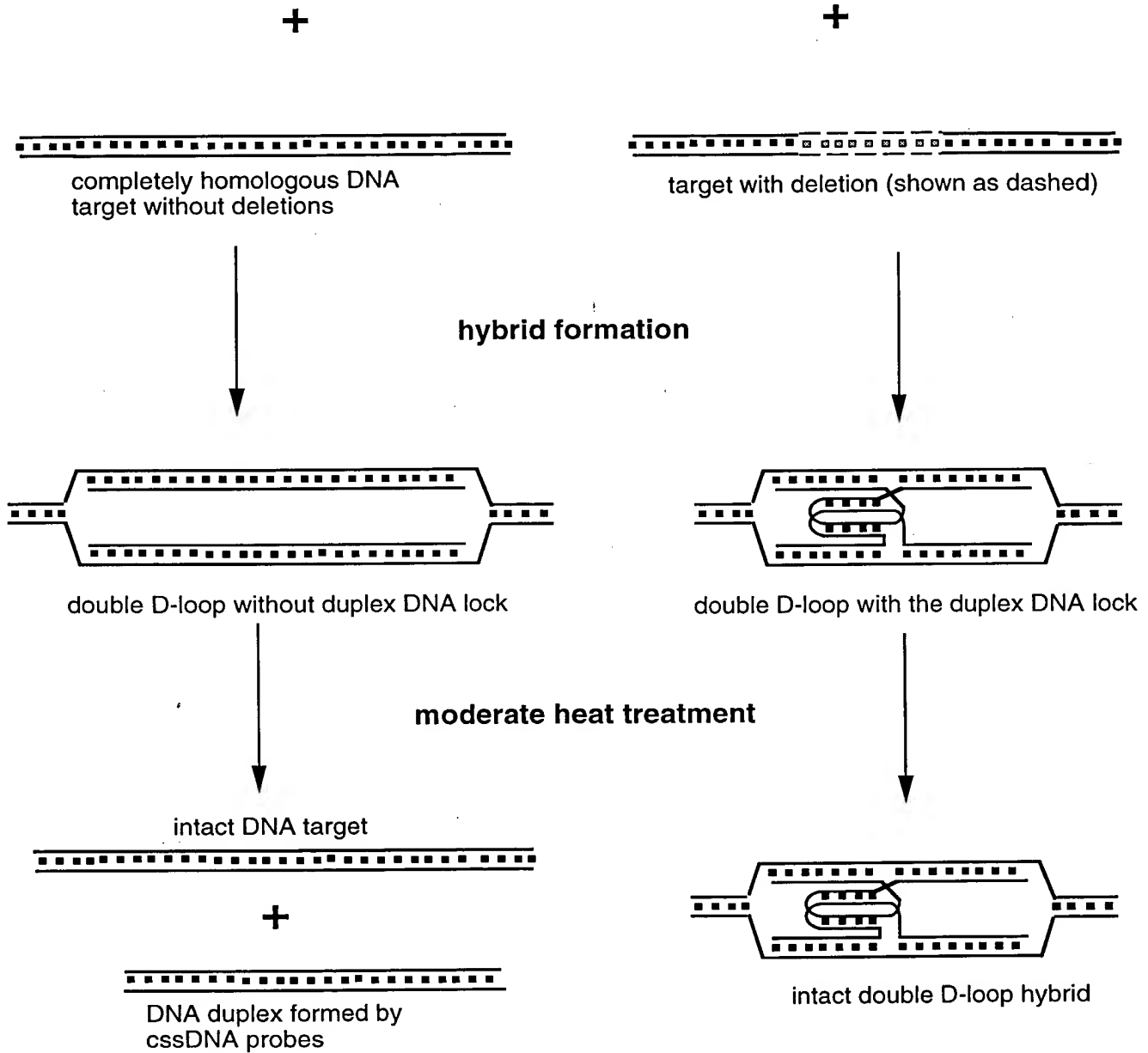
FIGURE 4



Hybrid recognition by
nucleic acid repair,
nucleic acid recombination,
and resolution enzymes

FIGURE 5

cssDNA probes



001240" E2425560

FIGURE 6

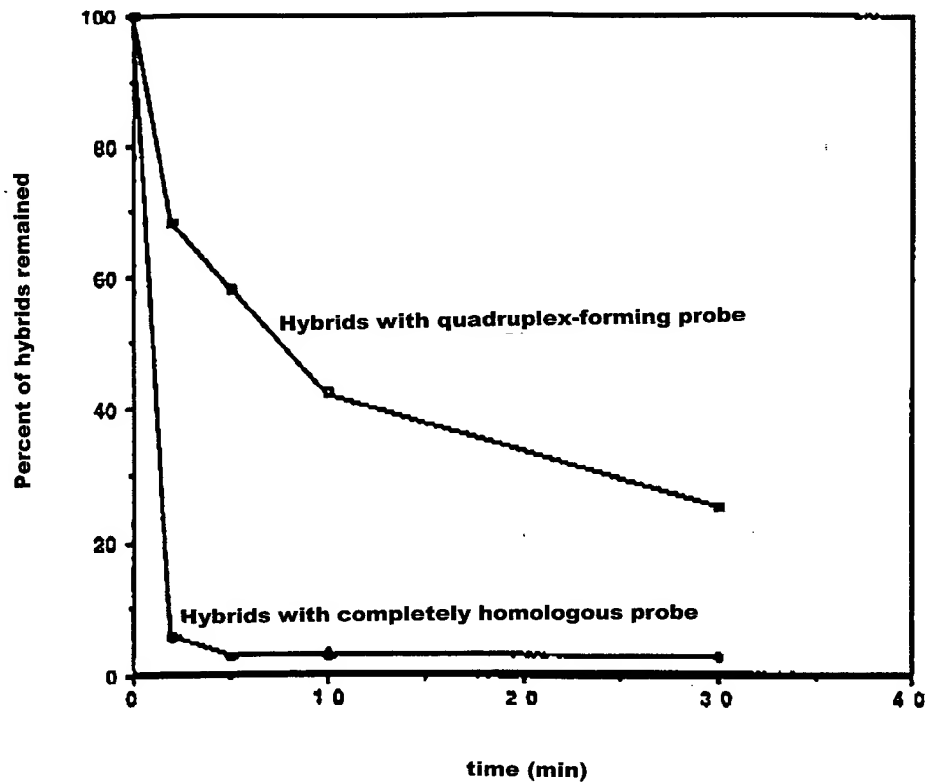


FIGURE 7

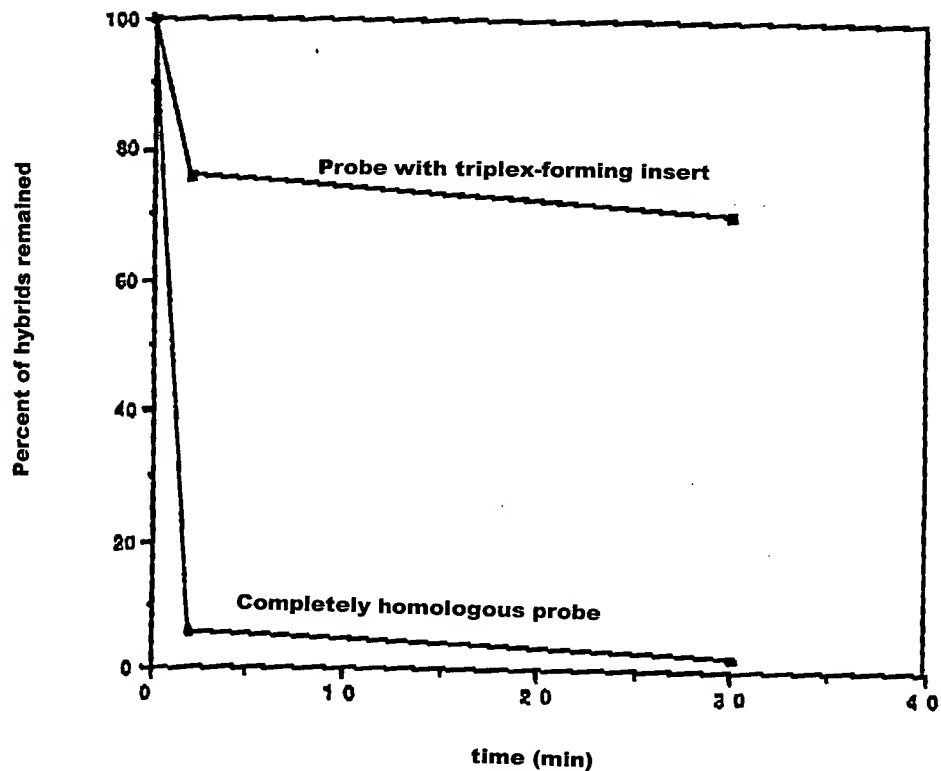
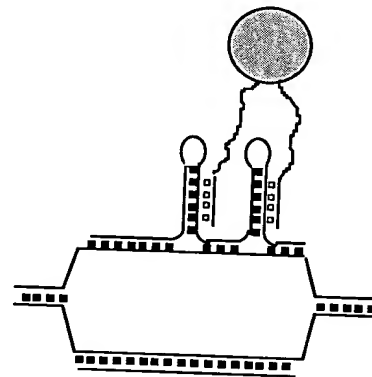
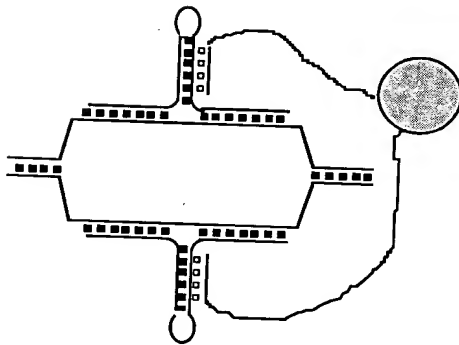
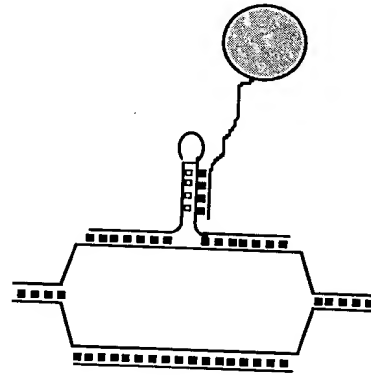
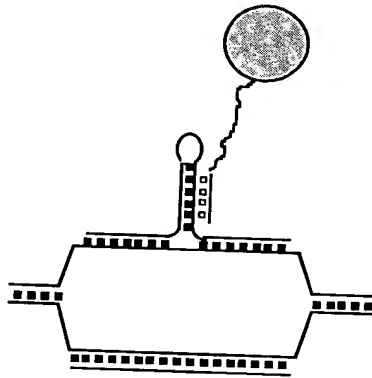


FIGURE 8A



09557423 042100

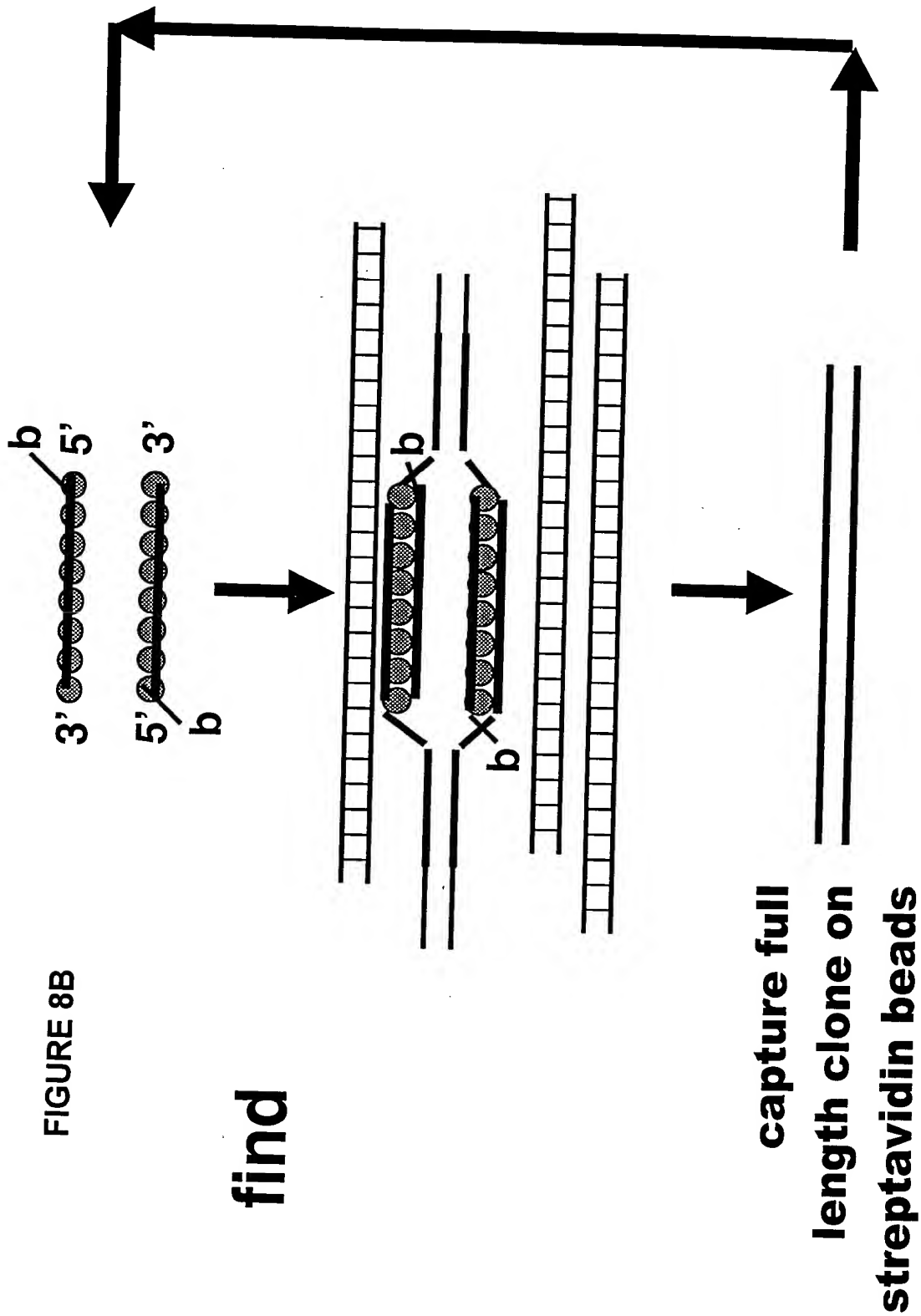
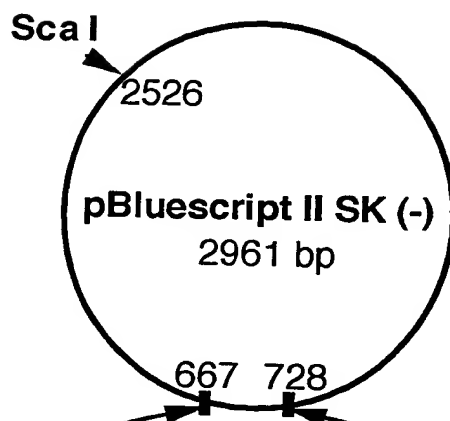


FIGURE 9



A.

5' - CCTCGAGGTCGACGGTATCGATAAGCTTGATATCGAATTCCTGCAGCCCGGGGATCCACTA - 3' NI_w

3' - GGAGCTCCAGCTGCCATAGCTATTCGAACTATAGCTTAAGGACGTCGGGCCCCCTAGGTGAT - b NI_c

B.

5' - CCTCGAGGTCGACGGTATCGATAAGCTTGAT **TGTGTGTGTGTGTGTGTGTGT** ATCGAATTCCTGCAGCCCGGGGATCCACTA - 3' ZI_w

3' - GGAGCTCCAGCTGCCATAGCTATTCGAACTA **ACACACACACACACACA** TAGCTTAAGGACGTCGGGCCCCCTAGGTGAT - b ZI_c

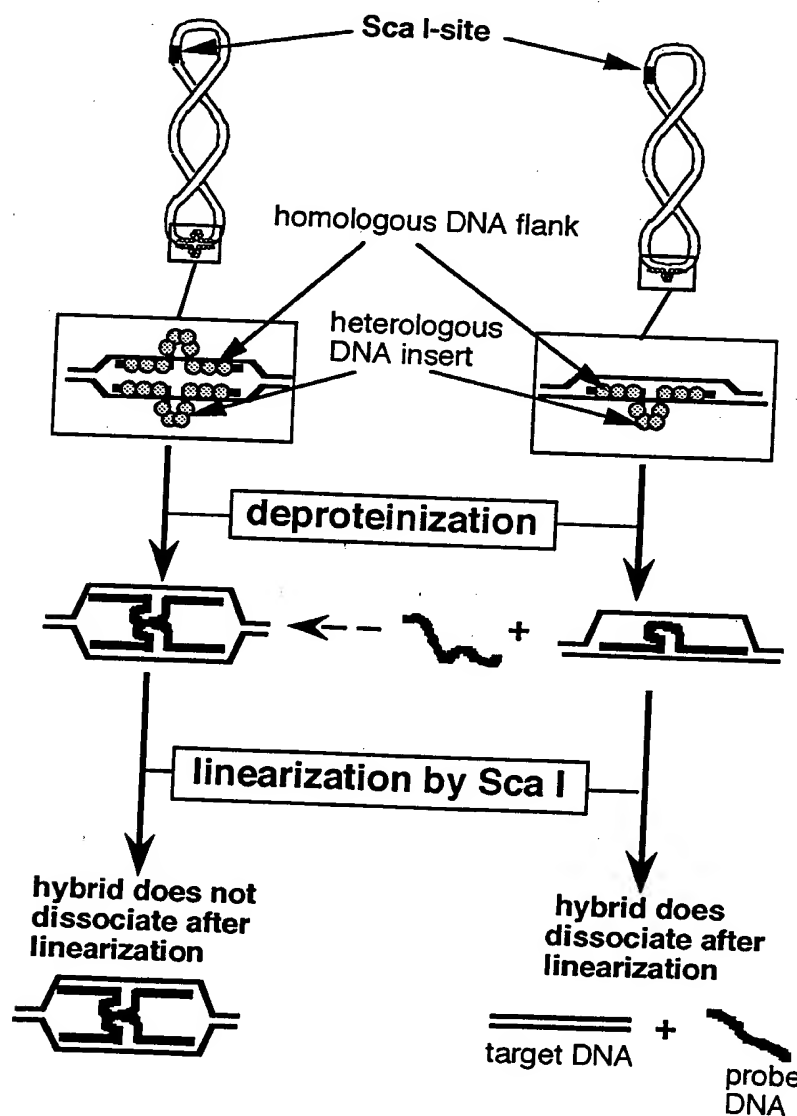
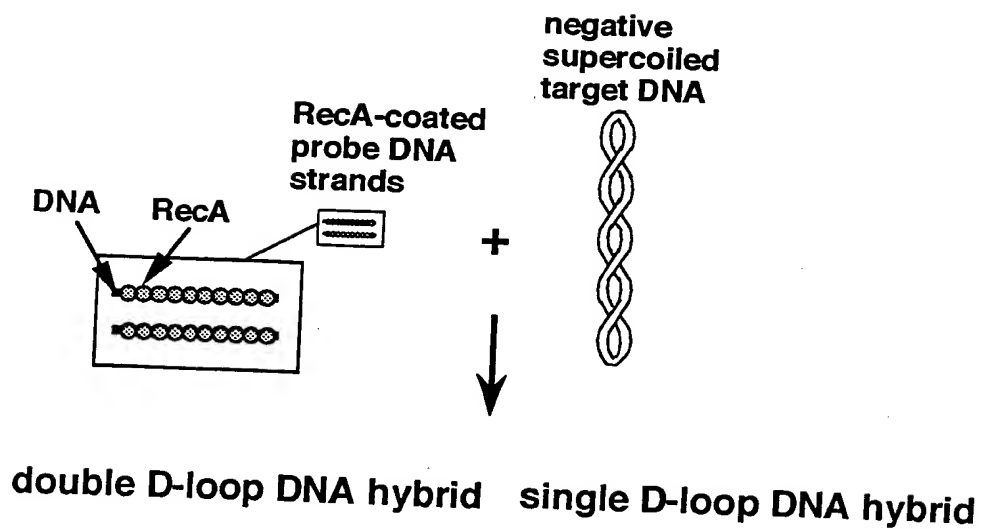
C.

5' - CCTCGAGGTCGACGGTATCGATAAGCTTGAT **TTGGGGTTGGGGTT** ATCGAATTCCTGCAGCCCGGGGATCCACTA - 3' QI_w

3' - GGAGCTCCAGCTGCCATAGCTATTCGAACTA **TTGGGGTTGGGGTT** TAGCTTAAGGACGTCGGGCCCCCTAGGTGAT - b QI_c

007240" 2242560

FIGURE 10



007240 "E2475560

FIGURE 11

+	+	-	-	+	+	+	+	second probe DNA strand	+	+	-	-	+	+	+	+
+	+	+	+	-	-	+	+	RecA protein	+	+	+	+	-	-	+	+
+	+	+	+	+	+	-	-	target homology	+	+	+	+	+	+	-	-
-	+	-	+	-	+	-	+	ScaI linearization	-	+	-	+	-	+	-	+
1	2	3	4	5	6	7	8		1	2	3	4	5	6	7	8

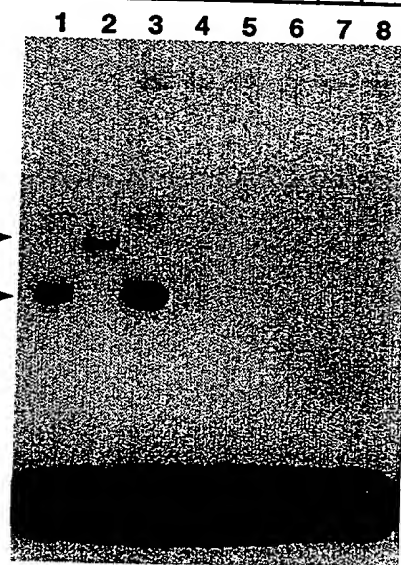
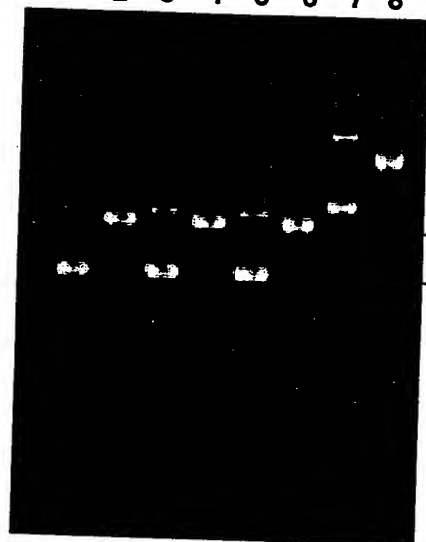
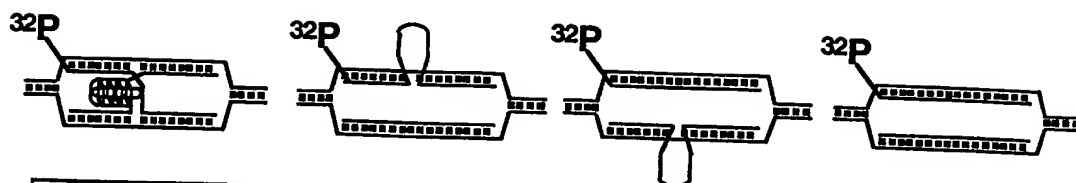


FIGURE 12

A.



³² P-labeled probe strand unlabeled probe strand incubation at 65°C (min.) lane	QI _w				QI _w				NI _w				NI _w			
	QI _c				NI _c				QI _c				NI _c			
	0	2	10	20	0	2	10	20	0	2	10	20	0	2	10	20
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16

origin



linear
hybrid →

unincorporated
probe

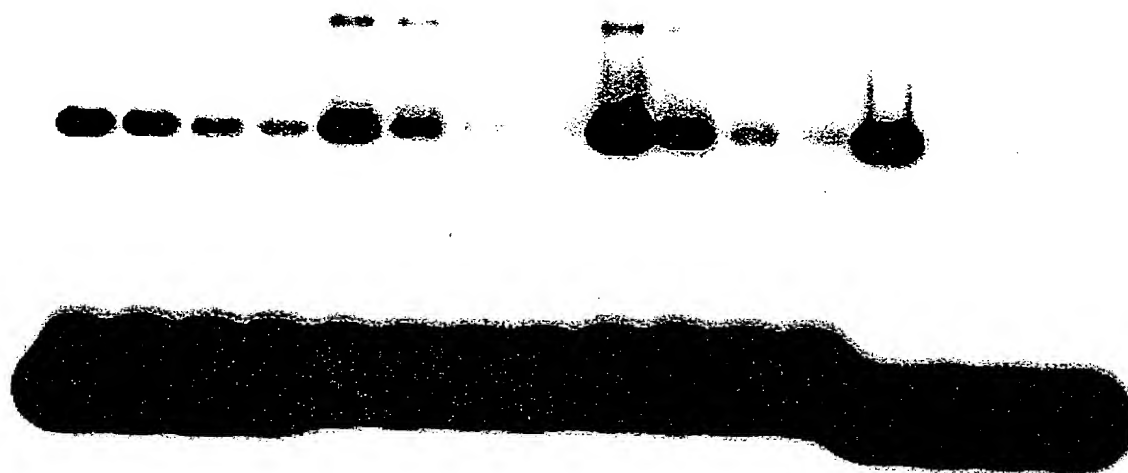
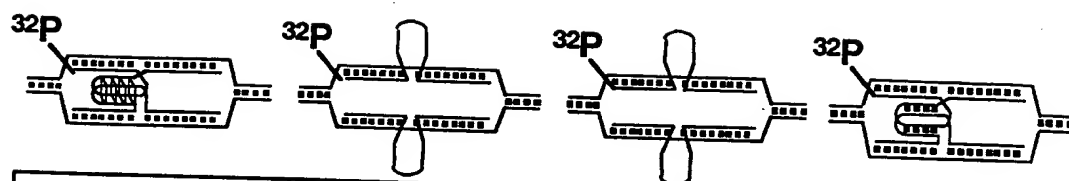


FIGURE 12

B.



³²P-labeled probe strand
unlabeled probe strand
incubation at 65°C (min.)

QI _w				QI _w				ZI _w				ZI _w			
QI _c				ZI _c				QI _c				ZI _c			
0	2	10	20	0	2	10	20	0	2	10	20	0	2	10	20
lane				lane				lane				lane			
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16

origin

--->

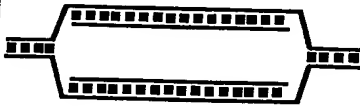
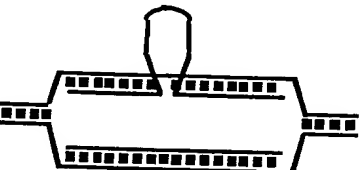
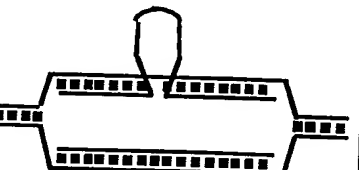
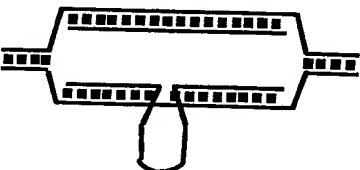
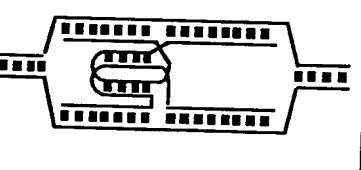
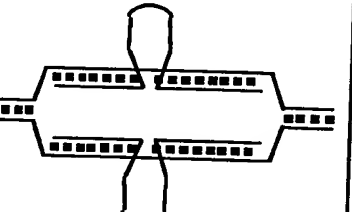
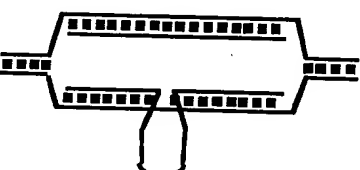
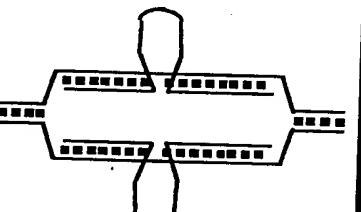
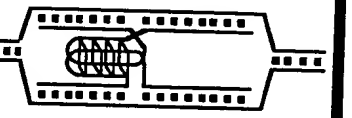
linear hybrid

sc

unincorporated probe

007240 "E242560

FIGURE 13

<div>top probe strand</div> <div>bottom probe strand</div>	NI_w	ZI_w	QI_w
NI_c	 $\tau_{1/2} < 2$	 $\tau_{1/2} < 2$	 $\tau_{1/2} < 2$
ZI_c	 $\tau_{1/2} < 2$	 $10 \leq \tau_{1/2} < 20$	 $\tau_{1/2} < 2$
QI_c	 $\tau_{1/2} < 2$	 $\tau_{1/2} < 2$	 $5 \leq \tau_{1/2} < 10$

NI = No DNA Insert

ZI = Z-DNA forming Insert

QI = Quadruplex-DNA forming Insert

w = Watson DNA strand

c = Crick DNA strand

$\tau_{1/2}$ = double D-loop DNA hybrid apparent half-life time (min.)

007240" E2425560

FIGURE 14

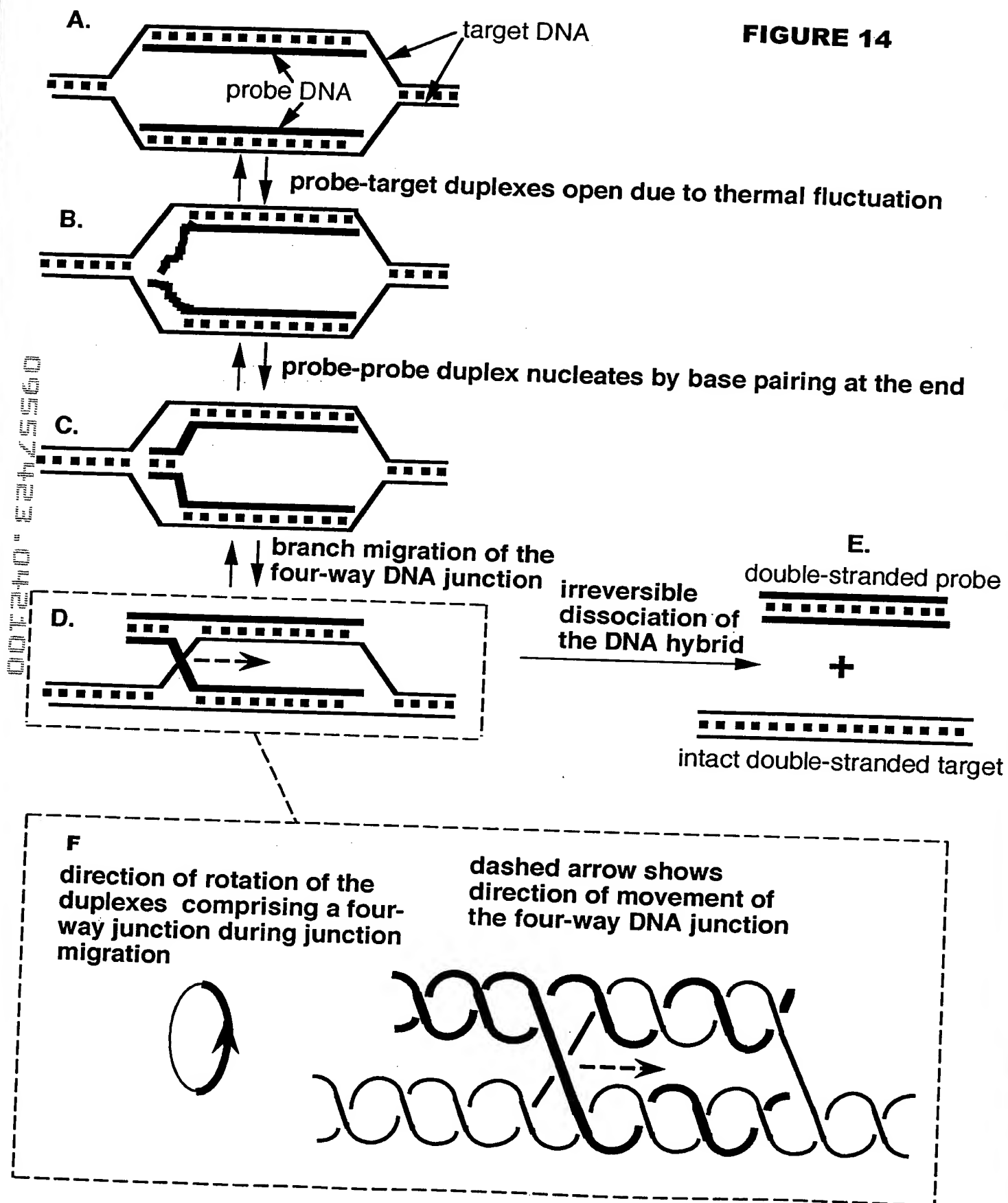


FIGURE 15

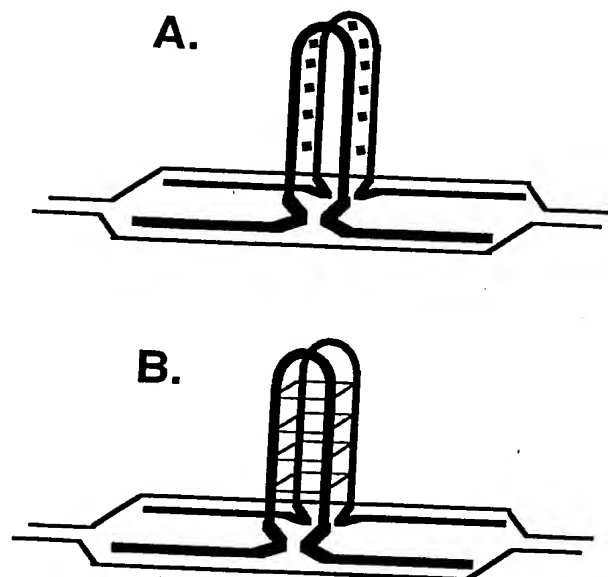
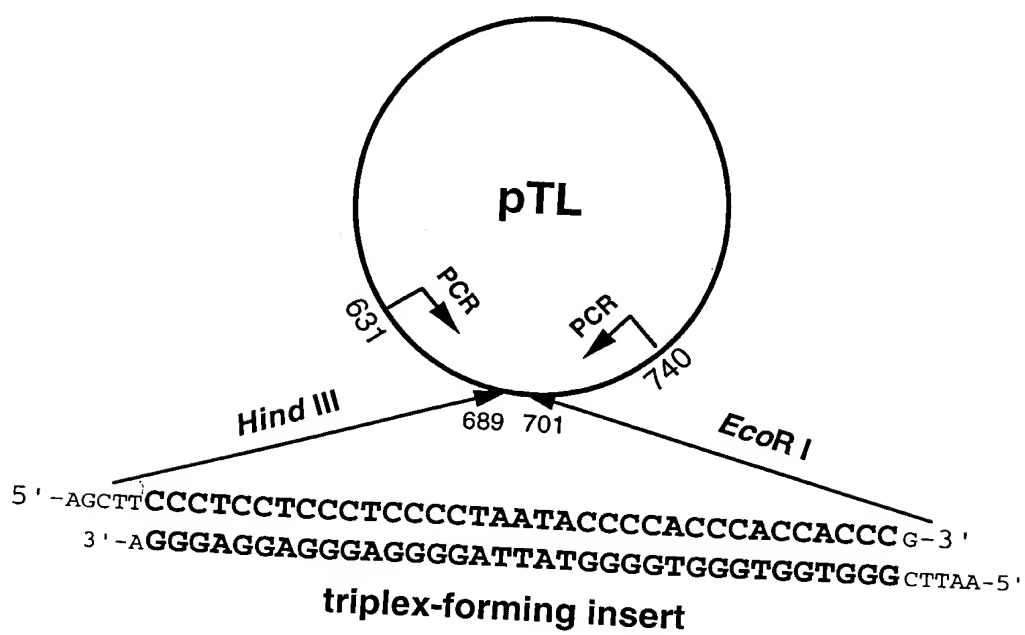
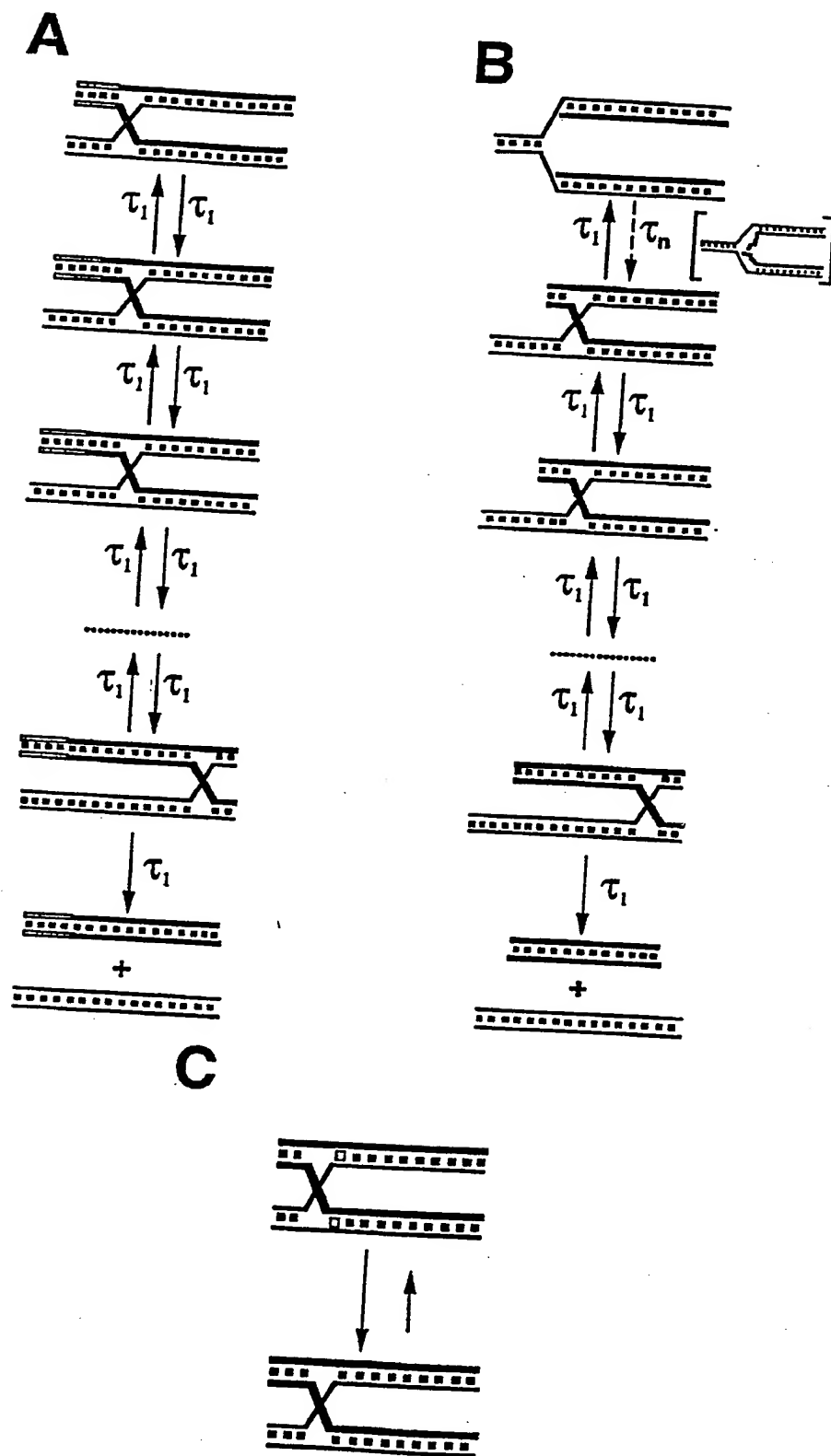


FIGURE 16



007240-244560

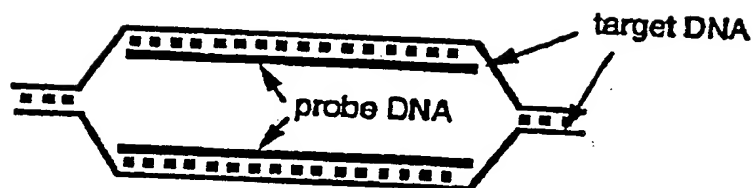
FIGURE 17



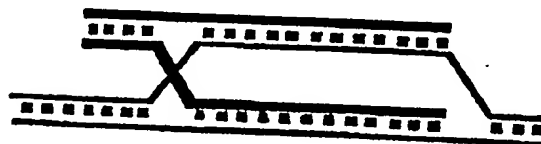
00T240" E2425560

FIGURE 18

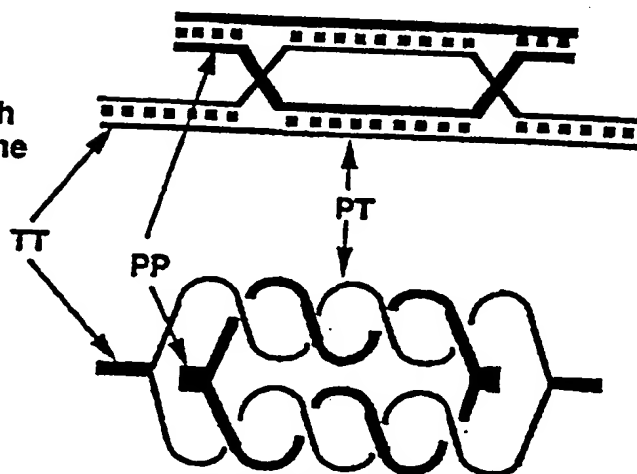
A: Double D-loop DNA without nucleation of the probe-probe duplex



B: Double D-loop DNA with single nucleation (sn) of the probe-probe duplex



C: Double D-loop DNA with double nucleation (dn) of the probe-probe duplex



TT = target-target DNA duplex

PP = probe-probe DNA duplex

PT = probe-target DNA duplex

probe DNA sequence
heterologous to target DNA

probe DNA sequence
homologous to target DNA

D: Double D-loop DNA with irreversible single nucleation of the probe-probe duplex at one end

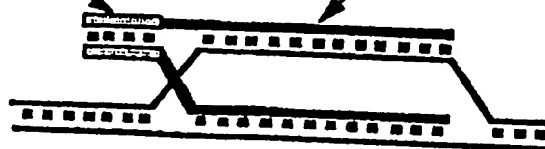


FIGURE 19

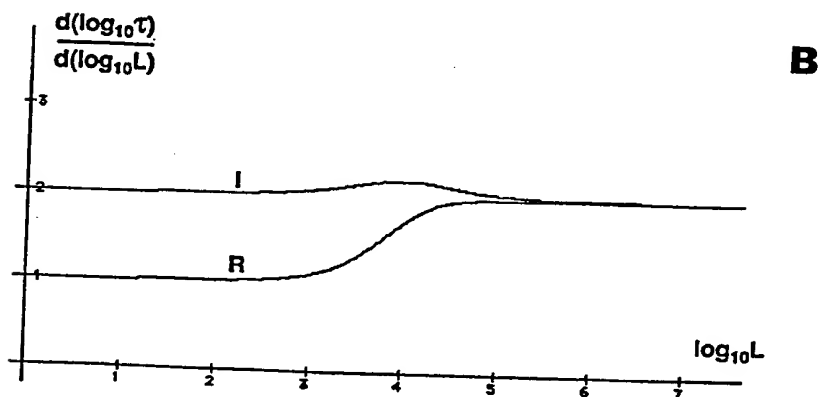
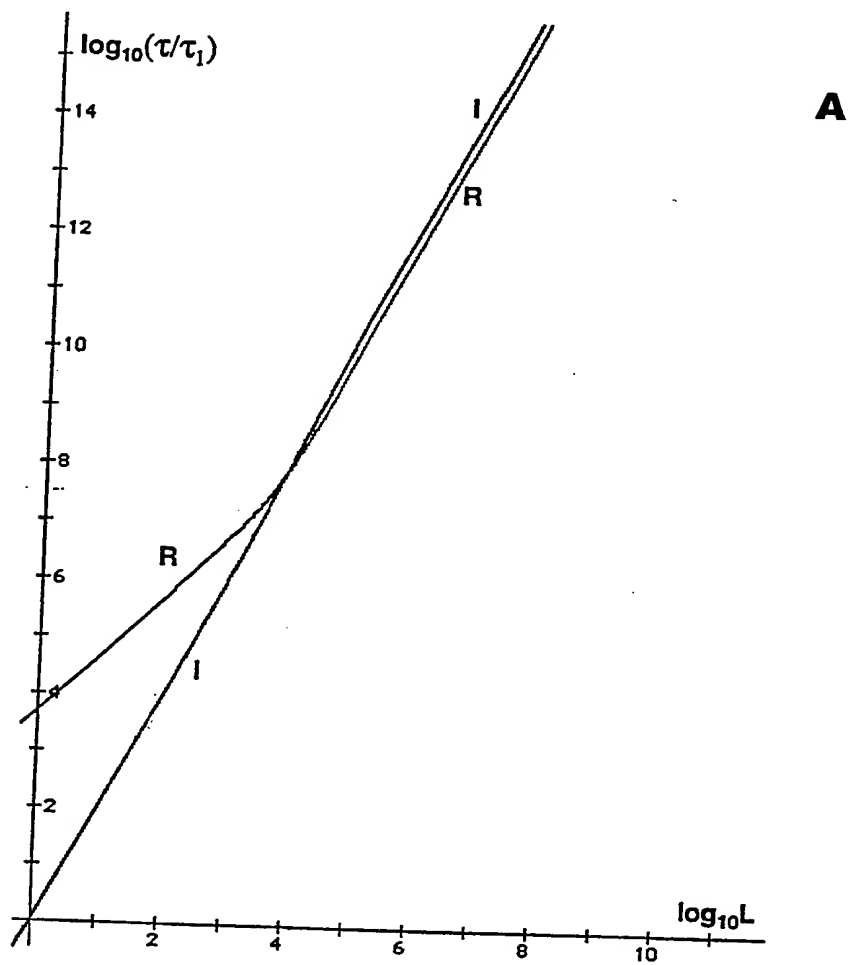
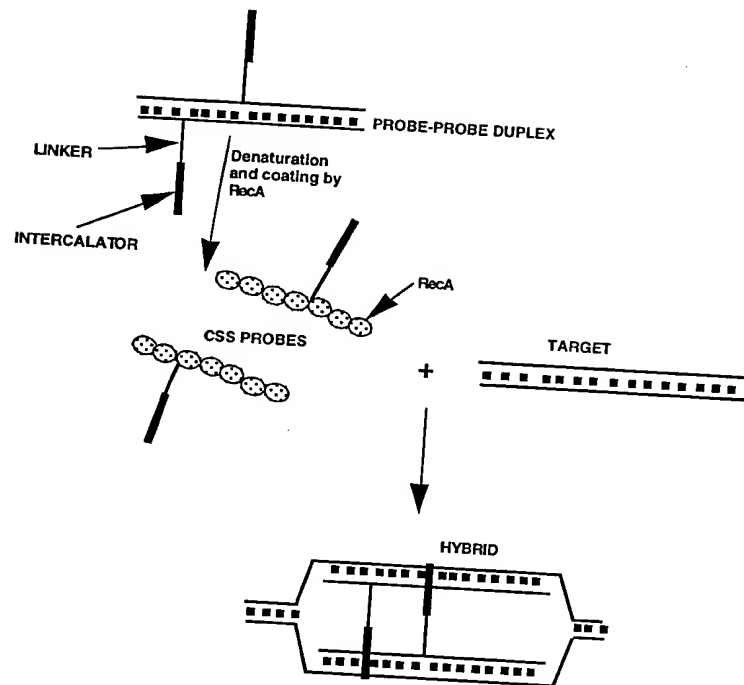


FIGURE 20



00T240" E24/5560